

## REMARKS

Claims 1-27, and 29-70, 72-83 are pending in the application. Claims 1, 29-31, 39, 51-52 and 72-74 are currently amended. Claim 28 has been previously cancelled. Claim 71 is currently cancelled. Claims 84-92 have been previously withdrawn without prejudice.

Claim 1 has been amended to incorporate further limitations that the low molecular weight polyol has a molecular weight less than one-half of the molecular weight of the vegetable oil-based polyol, and that the low molecular weight polyol is present in amounts from 0% to 30% by weight of the resin. Claims 29 and 52 have been amended to incorporate further limitations that the low molecular weight polyol has a molecular weight less than one-half of the molecular weight of the vegetable oil-based polyol, and that the low molecular weight polyol is present at from 1 pph to 10 pph based upon the weight of said vegetable oil-based polyol. Claim 39 has been amended to incorporate further limitations that the low molecular weight polyol has a molecular weight less than one-half of the molecular weight of the vegetable oil-based polyol. These amendments find support at, for example, lines 13-17 on page 19, line 8 on page 31 and line 10 on page 33 of the original Specification, as well as the original claim 39, wherein it is disclosed that varying amounts of low molecular weight polyol, such as glycerine, may be added to the vegetable oil-based polyol. Claim 51 has been amended for purpose of clarification. Claim 72 has been converted into an independent form by incorporating some limitations of claim 52 and maintaining the original limitation reciting glycerin in an amount ranging from 5 parts per hundred to 30 parts per hundred by weight of the vegetable oil-based polyol.

No new matter has been introduced by the present amendments.

### **I. Claim Rejections – Written Description**

Claims 1-27, 29-38 and 52-83 stand rejected for introducing new matter. Applicant respectfully disagrees. Claims 1 and 52 have been amended. Withdrawal of these rejections are respectfully requested.

## **II. Claim Objections – Improper Dependent Form**

Claims 29-30 and 72-73 have been objected to as being improper dependent claims for failing to further limit the subject matter of the independent claims. Claims 29-30 and 72-73 have been amended to cure this problem.

## **III. Claim Rejections – Obviousness-type Double Patenting**

Claims 1-27 and 29-83 stand rejected for obviousness-type double patenting over claims 1-12 of United States Patent 6,686,435 (the '435 Patent). The present invention represents an improvement over the invention disclosed in the '435 patent by adding a low molecular weight polyol to enhance the mechanical properties of the resultant polymer concrete. The addition of these low molecular weight polyols in the specific amounts and characterized as having a molecular weight less than one-half of the molecular weight of the vegetable oil-based polyol are novel and unobvious over the '435 patent.

The examiner recognizes that the present claims and the claims of the '435 patent are not identical, but maintains that these claims are not patentably distinct from each other. As currently amended, all rejected claims depend directly or indirectly from six independent claims, namely, claims 1, 29, 39, 51, 52, and 72, respectively. Claim 1 has been amended to incorporate further limitations that the low molecular weight polyol has a molecular weight less than one-half of the molecular weight of the vegetable oil-based polyol, and that the low molecular weight polyol is present in amounts from 0% to 30% by weight of the resin. Claims 29 and 52 have been amended to incorporate further limitations that the low molecular weight polyol has a molecular weight less than one-half of the molecular weight of the vegetable oil-based polyol, and that the low molecular weight polyol is present at from 1 pph to 10 pph based upon the weight of said vegetable oil-based polyol. Claim 39 has been amended to incorporate further limitations that the low molecular weight polyol has a molecular weight less than one-half of the molecular weight of the vegetable oil-based polyol. Claim 51, as previously presented, already has the limitation that glycerin is present in the amounts of from 5 pph to 10 pph by weight of the soy polyol. Applicant respectfully submits that these new limitations further distinguish Claims 1-27 and 29-83 from the claims of the '435 patent.

Applicant continues to traverse the Examiner's position that the low molecular weight polyol is part of the vegetable oil based polyol. Even if we assume that the low molecular weight polyol is part of the vegetable oil based polyol, the Examiner fails to point to any specific teaching in the '435 patent where it is disclosed that the low molecular weight polyol has a molecular weight less than one-half of the molecular weight of the vegetable oil-based polyol. The Examiner stated that the "[t]he instant specification does not define "low molecular weight." See page 6, line 7 of the Office Action dated 09/12/07. Applicant wishes to point out to the Examiner that the definition of "low molecular weight polyol" can be found at lines 13-17 on page 19 of the Specification as originally filed.

Even if, for argument's sake, we accept the Examiner's position that a polymer population necessarily has a range of different molecular weights. The Examiner has yet to establish that a polymer population necessarily has a certain member with a molecular weight less than one-half of the average molecular weight of that population. Indeed, the '435 patent teaches that the polyols are prepared in a way that the molecular weight distribution (MWD) is very narrow. Lines 40-47, Col. 5 of the '435 patent. This teaching of very narrow MWD, if anything, counters the Examiner's assumption that a low molecular weight fraction that is less than half of the average molecular weight of the polyols exists. Thus, it is merely speculative for the Examiner to assert that there is necessarily a fraction in the polyols of the '435 patent that can satisfy the definition of "low molecular weight polyols" as defined by the instant claims.

The Examiner appears to be improperly shifting the burden of proof in rejecting the instant claims under section 103. For instance, in support of the position that the '435 patent may have disclosed same the low molecular weight polyol as Applicant is claiming, the Examiner stated "[t]here is no probative evidence that the prior art polyol does not contain the instantly claimed amount of low molecular weight polyol." Applicant respectively submits that, in establishing a prima facie case of obviousness, it is the Examiner's burden to show that every limitation of the present claims have been taught or suggested by the prior art. It is inappropriate to require the Applicant to prove the negative before the Examiner first prove the positive. It is only until the Examiner's has shown that certain limitations are disclosed in the prior art does the burden shift to the Applicant to rebut the Examiner's position.

Moreover, even if we assume that the vegetable oil based polyols do contain a fraction of low molecular weight polyols that functions as crosslinker, there is still missing the limitation that the low molecular weight polyol is present at the amounts recited in the claims as amended. Claim 1 recites that the low molecular weight polyol is present in the amounts of from 0% to 30% by weight of the resin, and claims 29, 39, 51, 52, recite that either the low molecular weight polyol or glycerin is present at from 1 pph, or 5 pph in the case of claim 39, to 10 pph based upon weight of said vegetable oil-based polyol. Claim 72 recites the presence of glycerin in an amount ranging from 5 parts per hundred to 30 parts per hundred by weight of the vegetable oil-based polyol. The present specification is replete with references and data comparing the properties of the polymer concrete prepared by difference amounts of the low molecular weight polyol or glycerin. The optimal amounts of low molecular weight polyol to be added in the preparation of the polymer concrete is only discovered by the Applicant after many rounds of experiments. Thus, Applicant respectfully submits that this claim limitation is not disclosed by the '435 patent.

Moreover, many of the rejected claims recite glycerin, which is not even contemplated in the '435 patent. Applicant observes no reference to the term "glycerin" and sees no reasons why one of ordinary skill would infer from the '435 patent disclosure that the reaction described therein necessarily generates glycerine. Applicant respectfully requests that the Examiner point out specific pages in the '435 patent where the use of glycerine is disclosed or suggested. Because claims 1-12 of the '435 patent are distinguishable from the instant claims, withdrawal of the rejection of obviousness-type double patenting is respectfully requested.

#### **IV. Claim Rejections – 35 U.S.C. §102(b)**

Claims 1-7, 9-11, 13-16, 20-27, 35-52, 54-60, 63, 67-74, 78-81 and 83 stand rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent 2,902,388 to Szukiewicz ("Szukiewicz"). Applicant respectfully traverses this rejection and requests withdrawal of same. Although Szukiewicz teaches a hydraulic cement-polyurethane composition containing polyols, there is no mention of a crosslinker comprising low molecular weight polyols. Even if we assume that the polyols disclosed in Szukiewicz do contain a low molecular weight fraction that may serve as a crosslinker, there is no teachings in Szukiewicz that would suggest to one of ordinary skill in the art that this low molecular

weight fraction has a molecular weight that is less than half of the molecular weight of the vegetable oil-based polyols.

It is well known that the average molecular weight is determined by the relative distribution of polyols of various molecular weight. However, Szukiewicz merely discloses that the molecular weight range of the polyols is from 300-2,300. Lines 25-30, Col. 2. Because Szukiewicz provides no information regarding the molecular weight distribution of the polyols, one of ordinary skill in the art would not be able to ascertain the average molecular weight of the polyols disclosed in Szukiewicz. Thus, it is merely speculative to assume that there exists a fraction of low molecular weight polyols within the greater pool of polyols disclosed in Szukiewicz whose molecular weight is about half of the molecular weight of the vegetable oil-based polyols.

Szukiewicz also fails to teach the use of glycerine as a crosslinker as is recited by present claims 51, 72, and many of the dependent claims. Even if we assume that Szukiewicz inherently teaches a low molecular weight fraction of polyols that can serve as a crosslinker, it is against the plain language of Szukiewicz to state that glycerine is inherently part of such a low molecular weight fraction. The chemical formula of glycerine is  $C_3H_5(OH)_3$ , with a molecular weight of about 92. By contrast, Szukiewicz teaches that “polyols having molecular weights below 300 are too brittle” to be used. See lines 26-31, Col. 2. It is therefore mistaken for the Examiner to maintain that Szukiewicz anticipates those claims reciting glycerine when Szukiewicz teaches away from the use of glycerine.

Finally, even if we assume that the polyols of Szukiewicz do contain a fraction of low molecular weight polyols that functions as crosslinker, there is still missing the limitation that the low molecular weight polyol is present in the amounts as recited in the instant claims as amended. There is no reference in the Szukiewicz patent that would suggest to one of ordinary skills to use such amounts of the low molecular weight polyols. Taken together, because not all limitations of the present claims are described in the Szukiewicz patent, withdrawal of the §102(b) rejection is respectfully requested.

#### **V. Claim Rejections – 35 U.S.C. §103(a)**

Claims 1-7, 9-11, 13-16, 20-27, 35-60, 63, 67-74, and 78-83 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent 2,902,388 to Szukiewicz. Applicant respectfully traverses this rejection and requests withdrawal of same. As explained above,

Szukiewicz fails to teach or suggest every limitation of the present claims. The Examiner also fails to provide reasons why a skilled artisan would be motivated to modify the teachings of Szukiewicz in order to arrive at the invention presently claimed, such as the use of a low molecular weight polyol as a crosslinker to improve the mechanical property of the concrete composition. Thus, the Examiner fails to establish a *prima facie* case of obviousness and withdrawal of the rejection is respectfully requested.

For the foregoing reasons and with the amendments currently presented, Applicant is respectfully seeking a Notice of Allowance in the next Office Communication. Applicants' attorney urges Examiner Niland to telephone if a conversation could expedite prosecution. The Commissioner is authorized to charge any required fees to deposit account 12-0600.

Respectfully submitted,

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